

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-28 (Canceled)

29. (Currently Amended) A wafer processing apparatus, comprising:

a processing chamber defined by a lower wall, an upper wall and side walls extending from the lower wall to the upper wall, a wafer supply opening being formed in one of the walls for transferring a wafer into the chamber;

a susceptor in the processing chamber on which the wafer can be located so that an upper surface of the wafer faces the upper wall;

a manifold component located on the processing chamber and, together with the upper surface of the upper wall, defining a manifold cavity;

an exhaust line connected to the processing chamber, for flowing a an exhaust gas from the processing chamber, connected such that the exhaust gas has a tendency to flow toward the exhaust line; and

a processing gas supply line connected to the manifold component for providing a processing gas, wherein the processing gas comprises non-depleted reactive gases used for processing the wafer, the processing gas supply connected via a processing gas supply line opening formed through an upper surface of the manifold cavity, wherein the upper wall ~~has~~ comprises a plurality of processing gas supply openings, each of the processing gas supply openings formed into an upper surface and out of a lower surface of the upper wall such that each processing gas supply opening is defined by a corresponding interior surface of the

upper wall, the processing gas supply openings being non-uniformly distributed over the upper wall to create a flow pattern comprising a predominantly vertical flow of processing gas onto the wafer and mixing the resulting exhaust gases with non-uniformly distributed amounts of processing gas depending upon the position of the point of mixing relative to the exhaust line

~~that counteracts the tendency of the gas to flow toward the exhaust line, wherein the exhaust gas comprises reacted gases and depleted processing gas,~~ and thus promotes even processing over the upper surface of the wafer.

30. (Previously presented) The apparatus of claim 29 wherein the openings are more densely located on one side of the upper wall than on another side thereof.

31. (Previously presented) The apparatus of claim 30 wherein the openings are substantially equal in size.

32. (Currently Amended) The apparatus of claim 29 wherein flow of processing gas in the processing chamber is laminar.

33. (Currently Amended) The apparatus of claim 29 wherein the exhaust line is connected at an exhaust location which is off-center with respect to a center point of the wafer, when viewed from above, so that the processing gas exits out of the processing chamber at the exhaust location which is off-center with respect to a center point of the wafer.

34. (Currently Amended) The apparatus of claim 33, further comprising wherein a channel is ~~defined~~ within the processing chamber, wherein the channel ~~being~~ may be concentric with the wafer, wherein the processing gas may flow ~~flowing~~ radially outwardly over the wafer and into the channel, then from the channel; to the exhaust location ~~into the exhaust line~~.

35. (Previously presented) The apparatus of claim 34 wherein the openings are more densely located farther from the exhaust location.

36-37 (Canceled)

38. (Currently Amended) The apparatus of claim 29 wherein there are first and second ones of the openings on opposing sides of a point on the upper wall, the first opening having a lower end which is angularly displaced relative to an upper end thereof in a selected direction about the point, and the second opening having a lower end which is angularly displaced relative to an upper end thereof in the selected direction, so that the openings jointly create a circular processing gas flow pattern in the processing chamber.

39. (Previously Presented) The apparatus of claim 38 wherein a third of the openings, on a side of the second opening opposing the first opening, has a lower end which is displaced in the first direction relative to an upper end thereof.

40. (Currently Amended) The apparatus of claim 29 wherein the exhaust line is connected at an exhaust location which is off-center with respect to a center point of the wafer, when

viewed from above, so that the processing gas exits out of the wafer at the exhaust location which is off-center with respect to a center point of the wafer.

41. (Currently Amended) The apparatus of claim 40 wherein the openings are formed to increase a flow rate of the processing gas over the wafer farther from the exhaust location.

42. (New) A wafer processing apparatus, comprising:

a processing chamber defined by a lower wall, an upper wall and side walls extending from the lower wall to the upper wall;

a susceptor in the processing chamber on which the wafer can be located so that an upper surface of the wafer faces the upper wall;

a manifold component located on the processing chamber and, together with the upper surface of the upper wall, defining a manifold cavity;

an exhaust system comprising an exhaust line connected to the processing chamber, for flowing an exhaust gas from the processing chamber;

a processing gas supply line connected to the manifold component;

a plurality of processing gas supply openings distributed non-uniformly in the upper wall providing a means for supplying a processing gas from the manifold cavity to the processing chamber, wherein the processing gas comprises non-depleted reactive gases used for processing the wafer, wherein the exhaust gas comprises reacted gases and depleted processing gas, wherein the processing gas supply openings may be non-uniformly distributed over the upper wall, wherein the processing gas supply openings, the manifold cavity and component, processing gas supply, and exhaust system predominantly determine the flow pattern of processing gas onto the upper surface of the wafer, wherein the flow

pattern of processing gas may be capable of consistent uniform processing of the wafers over the entire surface of the wafer.

43. (New) The apparatus of claim 42, wherein the exhaust line is connected at an exhaust location which is off-center with respect to a center point of the wafer, when viewed from above, so that the processing gas exits out of the processing chamber at the exhaust location which is off-center with respect to a center point of the wafer.

44. (New) The apparatus of claim 42, wherein the processing gas openings comprises openings on the manifold cavity side of the upper wall that differ in location and/or direction than the corresponding openings on the processing chamber side of the upper wall.

45. (New) The apparatus of claim 42, wherein the processing gas supply openings create a predominately vertical flow pattern of processing gas onto the upper surface of the wafer.

46. (New) The apparatus of claim 42, wherein the processing gas provided into the processing chamber enters predominantly through the processing gas supply openings.

47. (New) A wafer processing apparatus, comprising:

a processing chamber defined by a lower wall, an upper wall and side walls extending from the lower wall to the upper wall;

a susceptor in the processing chamber on which the wafer can be located so that an upper surface of the wafer faces the upper wall;

a manifold component located on the processing chamber and, together with the upper

surface of the upper wall, defining a manifold cavity;

a processing gas supply line connected to the manifold component;

a plurality of processing gas supply openings in the upper wall, wherein a processing gas from the manifold cavity may pass into the processing chamber, wherein the processing gas comprises non-depleted reactive gases used for processing the wafer, wherein the processing gas supply openings may be non-uniformly distributed over the upper wall, wherein the processing gas supply openings create a predominately vertical flow pattern of processing gas onto the upper surface of the wafer, wherein the flow pattern of processing gas may be capable of consistent uniform processing of wafers over the entire surface of the wafer; and

an exhaust system comprising an exhaust line connected to the processing chamber, for flowing an exhaust gas from the processing chamber, wherein the exhaust gas comprises reacted gases and depleted processing gas;

48. (New) The apparatus of claim 47, wherein the processing gas provided into the processing chamber enters predominantly through the processing gas supply openings.

49. (New) The apparatus of claim 47, further comprising a channel within the processing chamber, wherein the channel may be concentric and below the wafer, wherein the processing gas may flow radially outwardly over the wafer and into the channel, and then from the channel to the exhaust location and into the exhaust line.

50. (New) The apparatus of claim 49, wherein the inner diameter of the channel may be comparable to or slightly less than the outer diameter of the wafer.